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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/037,885	MASAKI ET AL.	
	Examiner	Art Unit	
	YOGESH K. AGGARWAL	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53 and 59-108* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17,18,35,36,74,75,90 and 91* is/are allowed.

6)☒ Claim(s) *1-16,19-34,37-53,59-73,76-89 and 92-108* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments filed 12/22/2009 have been fully considered but they are not persuasive.

Examiner's response:

2. Applicant argues with regards to claims 1, 26, 37, 59, 82 and 92 that Gough fails to disclose the determination of a transfer control function based on the selected illumination intensity level mapping function since the Examiner is trying to equate the adjusting the threshold to determining a transfer control function based on the determined illumination intensity level mapping function. The Examiner respectfully disagrees. Gough teaches at step 64 (figure 5, col. 6 lines 46-54) that if the number of white out pixels are greater than the threshold 1 (See figure 6 for corresponding illumination intensity level greater than 1023 for white out pixels) then the preprocessor 16 should be programmed for a brighter scene. This is done by reprogramming the ADC 50 and the voltage detector 38. A transfer function is defined in IEEE dictionary, sixth edition as a relationship between the input and output signals of a circuit expressed as a mathematical function. In this case, when it is determined that the number of whiteout pixels is more than 20, ADC 50 and the voltage detector 38 are reprogrammed for an incrementally brighter scene. In other words, a programmable line 52 is changed that varies the threshold Vth on input line 44 to vary the output voltage. This is by definition a transfer function as it varies the relationship between the input and output of a circuit. The details of varying the threshold are explained at col. 5 lines 48-col. 6 line 26. Therefore the invention explains a method for intensity correction by reprogramming the A/D converter to adapt to higher brightness if number of pixels at saturation is above a threshold number. Hence the claimed

limitation " determination of a transfer control function (preprocessor 16 should be programmed for a brighter scene) based on the selected illumination intensity level mapping function (if the number of white out pixels are greater than the threshold 1 and figure 6 shows the corresponding illumination intensity level greater than 1023 for white out pixels) is taught.

3. Applicant argues with regards to claims 41 and 96 that Gough fails to disclose the determination of a transfer control function based on the selected illumination intensity level mapping function and the determined integration time. The Examiner respectfully disagrees. Gough teaches at step 64 (figure 5, col. 6 lines 46-54) that if the number of white out pixels are greater than the threshold 1 (See figure 6 for corresponding illumination intensity level greater than 1023 for white out pixels) then the preprocessor 16 should be programmed for a brighter scene. This is done by reprogramming the ADC 50 and the voltage detector 38. Gough teaches at step 64 (figure 5, col. 6 lines 46-54) that if the number of white out pixels are greater than the threshold 1 (See figure 6 for corresponding illumination intensity level greater than 1023 for white out pixels) then the preprocessor 16 should be programmed for a brighter scene.

This is done by reprogramming the ADC 50 and the voltage detector 38. A transfer function is defined in IEEE dictionary, sixth edition as a relationship between the input and output signals of a circuit expressed as a mathematical function. In this case, when it is determined that the number of whiteout pixels is more than 20, ADC 50 and the voltage detector 38 are reprogrammed for an incrementally brighter scene. In other words, a programmable line 52 is changed that varies the threshold Vth on input line 44 to vary the output voltage. This is by definition a transfer function as it varies the relationship between the input and output of a circuit. The details of varying the threshold are explained at col. 5 lines 48-col. 6 line 26.

Therefore the invention explains a method for intensity correction by reprogramming the A/D converter to adapt to higher brightness if number of pixels at saturation is above a threshold number. Hence the claimed limitation " determination of a transfer control function (preprocessor 16 should be programmed for a brighter scene) based on the selected illumination intensity level mapping function (if the number of white out pixels are greater than the threshold 1 and figure 6 shows the corresponding illumination intensity level greater than 1023 for white out pixels) is taught. This function is imposed upon a pixel of the digital imager since this newly programmed ADC 36 and voltage detector would be used to act upon the brighter scene values. The threshold does not act on integration time of the pixel and it is also not claimed. Therefore Gough teaches the claimed limitations.

The concept of changing integration time based upon the number of pixels greater than a threshold is taught in Fossum. Fossum teaches that when the number of pixels greater than 30% are counted to be more than a threshold, the integration time for pixels is lowered (col. 2 lines 28-43, figure 2) in order to compensate for overexposure so that the image does not appear saturated and therefore is less blurry.

4. Applicant argues with regards to claims 52 and 107 that Gough fails to disclose fails to disclose or suggest determining a first transfer control function based on the selected first compression and/or determining a second transfer control function based on the determined second illumination intensity level mapping function. Gough teaches at step 64 (figure 5, col. 6 lines 46-54) that if the number of white out pixels are greater than the threshold 1 (See figure 6 for corresponding illumination intensity level greater than 1023 for white out pixels) then the preprocessor 16 should be programmed for a brighter scene. This is done by reprogramming the

ADC 50 and the voltage detector 38. A transfer function is defined in IEEE dictionary, sixth edition as a relationship between the input and output signals of a circuit expressed as a mathematical function. In this case, when it is determined that the number of whiteout pixels is more than 20, ADC 50 and the voltage detector 38 are reprogrammed for an incrementally brighter scene. In other words, a programmable line 52 is changed that varies the threshold Vth on input line 44 to vary the output voltage. This is by definition a transfer function as it varies the relationship between the input and output of a circuit. The details of varying the threshold are explained at col. 5 lines 48-col. 6 line 26. Therefore the invention explains a method for intensity correction by reprogramming the A/D converter to adapt to higher brightness if number of pixels at saturation is above a threshold number. Therefore the claimed limitation " determination of a transfer control function (preprocessor 16 should be programmed for a brighter scene) based on the selected illumination intensity level mapping function (if the number of white out pixels are greater than the threshold 1 and figure 6 shows the corresponding illumination intensity level greater than 1023 for white out pixels) is taught. This function is imposed upon a pixel of the digital imager since this newly programmed ADC 36 and voltage detector would be used to act upon the brighter scene values. The threshold does not act on integration time of the pixel and it is also not claimed. Therefore Gough teaches the claimed limitations.

The concept of the first illumination intensity level mapping function representing a greater compression of the resolution of the high illumination intensity levels of the scene than the second illumination intensity level mapping function is being taught by Gallagher. Gallagher teaches wherein the saturated pixels are compressed with a higher error corresponding to high illumination intensity levels of the scene than the second illumination intensity level (col. 9 line

64-col. 10 line 10). Therefore taking the combined teachings of Gough and Gallagher, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have the saturated pixels are compressed with a higher error corresponding to high illumination intensity levels of the scene than the second illumination intensity level in order to set the compression differently.

5. Examiner thanks the applicant for making the claims 17, 18, 35, 36, 74, 75, 90 and 91 as allowable. Therefore these claims are allowed.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 3, 4, 7-14, 24, 25, 26, 28, 31-34, 37, 39, 59, 61, 64-71, 81, 82, 86-89, 92 and 94 are rejected under 35 U.S.C. 102(e) as being anticipated by Gough (US Patent # 6,816,200).

[Claim 1]

Gough teaches a method of adaptively controlling sensitivity, on a pixel-by-pixel basis, of a digital imager, comprising: (a) determining a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels (col. 6 lines 27-54, figure 5, See figure 6 for corresponding illumination levels) (b) determining an illumination intensity level mapping function based upon the determined number of pixels within the first defined range of illumination intensity levels (col. 6 lines 46-54, setting of flag A or flag B); (c)

determining a transfer control function based on the determined illumination intensity level mapping function (col. 6 lines 46-54, programming for a brighter scene); and (d) imposing the determined transfer control function upon a pixel of the digital imager (See abstract, light sensor is reprogrammed for a brighter scene).

[Claim 3]

It is noted that it is within the skill of an ordinary person i.e. the user of the camera to repeat the method (a) - (d) until a desired dynamic range is realized.

[Claim 4]

Gough teaches wherein the first defined range of illumination intensity levels is a range of illumination intensity levels including an illumination intensity level representing pixel saturation (col. 6 lines 42-45).

[Claim 7]

Gough teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels determines a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels from a frame of pixels of image data created by the digital imager (col. 6 lines 33-45).

[Claim 8]

Gough teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels determines a number of pixels of image data having illumination intensity levels within a first

defined range of illumination intensity levels from a partial frame of pixels of image data created by the digital imager (col. 6 lines 33-45, the whole frame includes a partial frame of pixels).

[Claim 9]

Gough teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels determines a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels from a defined area within a frame of pixels of image data created by the digital imager (col. 6 lines 33-45, the whole area is read as a defined area).

[Claim 10]

Gough teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels determines a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels from a user-defined area within a frame of pixels of image data created by the digital imager (since the user has to press the power button in order for the image taking to take place, any frame or area within the frame is considered to be a user defined area).

[Claim 11]

Gough teaches wherein the determined illumination intensity level mapping function is a calculated illumination intensity level mapping function, the calculation being based upon the determined number of pixels within the first defined range of illumination intensity levels (col. 6 lines 33-54 teach setting the flag A based on the number of white out pixels).

[Claim 12]

Gough teaches wherein the determined illumination intensity level mapping function is a selected illumination intensity level mapping function selected from a plurality of pre-specified illumination intensity level mapping functions, the selection being based upon the determined number of pixels within the first defined range of illumination intensity levels (col. 6 lines 33-54, each pixel is read as having a illumination intensity mapping function, therefore the overall setting of the flag is based upon the plurality of illumination intensity levels).

[Claim 13]

Gough teaches wherein the determined transfer control function is a calculated transfer control function, the calculation being based upon the determined illumination intensity level mapping function (col. 6 lines 46-54, programming for a brighter scene).

[Claim 14]

Gough teaches, wherein the determined transfer control function is a selected transfer control function from a plurality of pre-specified transfer control functions, the selection being based upon the determined illumination intensity level mapping function (col. 6 lines 33-54, each pixel is read as having a plurality of transfer control functions, therefore the overall setting of the flag is based upon the plurality of transfer control functions).

[Claim 24]

Gough teaches at least three transfer functions corresponding to three different intensity levels (figure 6). However it would be a matter of design choice to set the number of transfer functions as eight wherein the number of illumination intensity level mapping functions to select from is eight in order to suitably adjust the exposure time for a particular scene.

[Claim 25]

Gough teaches further comprising: (d) determining, for each of a plurality of defined ranges of illumination intensity levels (each pixel is considered to have a transfer mapping function), a number of pixels within the defined range of illumination intensity levels when the determined number of pixels within the first defined range of illumination intensity levels is above a first threshold; and (e) determining, for each defined range of illumination intensity levels, an illumination intensity level mapping function based upon the determined number of pixels within the defined ranges of illumination intensity levels (col. 6 lines 28-54, figures 5 and 6).

[Claim 26]

Gough teaches a method of adaptively controlling sensitivity, on a pixel-by-pixel basis, of a digital imager, comprising: (a) determining a plurality of numbers of pixels, each determined number of pixels being a number of pixels within an associated defined range of illumination intensity levels (col. 6 lines 27-54, figure 5, See figure 6 for corresponding illumination levels); (b) determining a plurality of illumination intensity level mapping functions, each determined illumination intensity level mapping function corresponding to one defined range of illumination intensity levels, each illumination intensity level mapping function being determined based upon the determined number of pixels within an associated defined range of illumination intensity levels (col. 6 lines 46-54, setting of flag A or flag B); (c) determining a transfer control function based on the plurality of determined illumination intensity level mapping functions; (col. 6 lines 46-54, programming for a brighter scene); and (d) imposing the determined transfer control function upon a pixel of the digital imager (See abstract, light sensor is reprogrammed for a brighter scene).

[Claims 28, 31-34]

These claims are similar to claims 3 and 7-10 respectively. Therefore they have been analyzed and rejected based upon claims 3 and 7-10.

[Claim 37]

Gough teaches a method of adaptively controlling sensitivity, on a pixel-by- pixel basis, of a digital imager, comprising: (a) determining a number of saturated pixels; (b) selecting a first illumination intensity level mapping function when the determined number of saturated pixels is above a first threshold (col. 6 lines 27-54, figure 5, See figure 6 for corresponding illumination levels, setting of flag A); (c) determining a number of pixels having illumination intensity levels within a defined range of values (col. 6 lines 27-54, figure 5); (d) selecting a second illumination intensity level mapping function when the determined number of pixels is below a second threshold (col. 6 lines 46-54, setting of flag A or flag B); (e) determining a transfer control function based on the selected illumination intensity level mapping function (col. 6 lines 46-54, programming for a brighter scene); and (f) imposing the determined transfer control function upon a pixel of the digital imager (See abstract, light sensor is reprogrammed for a brighter scene).

[Claim 39]

Gough teaches wherein said determination of the number of pixels having illumination intensity levels within a defined range of values determines the number of pixels when the determined number of saturated pixels is below a first threshold (col. 6 lines 27-54, figure 5, See figure 6 for corresponding illumination levels, setting of flag B).

[Claims 59, 61, 64-71, 81, 82, 86-89, 92 and 94]

These are apparatus claims corresponding to method claims 1, 3, 4, 7-14, 24, 25, 26, 28, 31-34, 37, 39 respectively and are therefore analyzed and rejected based upon method claims 1, 3, 4, 7-14, 24, 25, 26, 28, 31-34, 37, 39.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2, 5, 6, 15, 16, 19-23, 27, 29, 30, 40, 41-47, 60, 62, 63, 72, 73, 76-80, 83-85, 95, and 96-102 rejected under 35 U.S.C. 103(a) as being unpatentable over Gough (US Patent # 6,816,200) in view of Fossum et al. (US Patent # 6,906,745).

[Claim 2]

Gough teaches determining a number of pixels having illumination intensity levels within a second defined range of illumination intensity levels (col. 6 lines 55-61) and programming based upon the determined number of pixels having illumination intensity levels within a second defined range of illumination intensity levels (col. 6 lines 55-61); said determination of the transfer control function being determined based on the determined illumination intensity level mapping function (col. 6 lines 33-54, depending upon the setting of flag A and program selected, the transfer control function is changed). Gough fails to disclose that the reprogrammed sensor changes an integration time. However Fossum teaches that when the number of pixels greater than 30% are counted to be more than a threshold, the integration time for pixels is lowered (col. 2 lines 28-43, figure 2) in order to compensate for overexposure so that the image does not

appear saturated and therefore is less blurry. Therefore taking the combined teachings of Gough and Fossum, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have changed the integration time in order to compensate for overexposure so that the image does not appear saturated and therefore is less blurry.

[Claim 5]

Gough teaches wherein the second defined range of illumination intensity levels is a range of illumination intensity levels including an illumination intensity level representing near saturation level (col. 6 lines 46-54). Fossum teaches a minimum illumination intensity level for MSBs zero (col. 2 lines 40-43).

[Claim 6]

Gough teaches wherein the first defined range of illumination intensity levels is a range of illumination intensity levels including an illumination intensity level representing pixel saturation (col. 6 lines 42-45). Fossum teaches second defined range of illumination intensity levels is a range of illumination intensity levels including an illumination intensity level representing a minimum illumination intensity level adjusted for a pixel offset value (col. 2 lines 49-50, point B is an underexposed condition and is offsetted by a pixel offset value form the reference point of zero).

[Claim 15]

The method as claimed in claim 2, wherein the determined transfer control function is a calculated transfer control function, the calculation being based upon the determined illumination intensity level mapping function (col. 6 lines 46-54, programming for a brighter scene). Fossum teaches determining integration time (col. 2 lines 28-50).

[Claim 16]

Gough teaches wherein the determined transfer control function is a selected transfer control function from a plurality of pre-specified transfer control functions, the selection being based upon the determined illumination intensity level mapping function (col. 6 lines 33-54, each pixel is read as having a plurality of transfer control functions, therefore the overall setting of the flag is based upon the plurality of transfer control functions). Fossum teaches determining integration time (col. 2 lines 28-50).

[Claim 19]

Gough teaches wherein the illumination intensity level mapping function is determined independently of the determination of the integration time (since there is no mention determining integration time in Gough reference, the setting of flag is independent of the integration time).

[Claim 20]

Fossum teaches that the number of pixels that correspond to a mapping function and are above or below a particular threshold is dependent thereupon an integration time (col. 2 lines 28-48).

[Claim 21]

Fossum teaches wherein the illumination intensity level mapping function i.e. the number of pixels corresponding to an intensity level is determined prior to the determination of the integration time (col. 2 lines 28-48).

[Claim 22]

Gough in view of Fossum fails to teach wherein the illumination intensity level mapping function is determined after the determination of the integration time. However Official notice is taken that it is very well known to have determined illumination intensity level mapping function

is determined after the determination of the integration time in order to reduce the load on the processor.

[Claim 23]

Fossum teaches wherein determinations of the illumination intensity level mapping function and the integration time are determined substantially simultaneously (col. 2 lines 28-48)..

[Claims 27, 29, 30]

These claims are similar to claims 2, 5 and 6 respectively. Therefore they have been analyzed and rejected based upon claims 2, 5 and 6.

[Claim 40]

Gough teaches determining a number of pixels having illumination intensity levels within a second defined range of illumination intensity levels (col. 6 lines 55-61) and programming based upon the determined number of pixels having illumination intensity levels within a second defined range of illumination intensity levels (col. 6 lines 55-61); said determination of the transfer control function being determined based on the determined illumination intensity level mapping function and the determined integration time (col. 6 lines 33-54, depending upon the setting of flag A and program selected, the transfer control function is changed). Gough fails to disclose that the reprogrammed sensor changes an integration time. However Fossum teaches that when the number of pixels greater than 30% are counted to be more than a threshold, the integration time for pixels is lowered (col. 2 lines 28-43, figure 2) in order to compensate for overexposure so that the image does not appear saturated and therefore is less blurry. Therefore taking the combined teachings of Gough and Fossum, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have changed the integration time in

order to compensate for overexposure so that the image does not appear saturated and therefore is less blurry.

[Claim 41]

This is a combination of claims 1, 2, 4 and 5 respectively. Therefore it has been analyzed and rejected based upon claims 1, 2, 4 and 5.

[Claim 42]

Gough teaches wherein the transfer control function comprises a plurality of discrete transfer control functions col. 6 lines 33-54, each pixel is read as having a plurality of transfer control functions, therefore the overall setting of the flag is based upon the plurality of transfer control functions).

[Claims 43-45]

Gough teaches at least three discrete transfer functions corresponding to three different intensity levels (figure 6). However it would be a matter of design choice to set the number of transfer functions as eight wherein the number of illumination intensity level mapping functions to select from is eight in order to suitably adjust the exposure time for a particular scene.

[Claims 46-47]

Gough teaches said determination of each of discrete transfer control function being determined based on the plurality of determined illumination intensity level mapping function (col. 6 lines 33-54, depending upon the setting of flag A and program selected, the transfer control function is changed).

[Claims 60, 62, 63, 72, 73, 76-80, 83-85, 95, and 96-102]

These are apparatus claims corresponding to method claims 2, 5, 6, 15, 16, 19-23, 27, 29, 30, 40, 41-47 respectively and are therefore analyzed and rejected based upon method claims 2, 5, 6, 15, 16, 19-23, 27, 29, 30, 40, 41-47.

10. Claims 38, 52, 53, 93, 107, 108 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gough (US Patent # 6,816,200) in view of Gallagher et al. (US Patent # 6,765,611).

[Claim 38]

Gough fails to teach wherein the first illumination intensity level mapping function represents a greater compression of the resolution of the high illumination intensity levels of the scene than the second illumination intensity level mapping function.. However Gallagher wherein the saturated pixels are compressed with a higher error corresponding to high illumination intensity levels of the scene than the second illumination intensity level (col. 9 line 64-col. 10 line 10). Therefore taking the combined teachings of Gough and Gallagher, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have the saturated pixels are compressed with a higher error corresponding to high illumination intensity levels of the scene than the second illumination intensity level in order to set the compression differently.

[Claim 52]

Gough teaches a method of adaptively controlling sensitivity, on a pixel-by- pixel basis, of a digital imager, comprising: (a) selecting a first illumination intensity level mapping function; (b) determining a first transfer control function based on the selected first compression; (c) imposing the determined first transfer control function upon a pixel of the digital imager; (d) determining a histogram of illumination intensity levels of pixels of image data being generated by the digital imager having the determined first transfer control function imposed thereon; (e) determining an

illumination intensity level maximum, the illumination intensity level maximum representing a greatest illumination intensity level for a pixel in a sample forming the histogram; (f) determining a second illumination intensity level mapping function, based on the determined intensity level maximum, the second illumination intensity level mapping function preventing the generation of any saturated pixels and providing a dynamic range of image data enabling each level in the histogram to be realized by the digital imager; (g) determining a second transfer control function based on the determined second illumination intensity level mapping function; and (h) imposing the determined second transfer control function upon a pixel of the digital imager. Gough fails to teach wherein the transfer control function is based on selected first compression. However Gallagher wherein the saturated pixels are compressed with a higher error corresponding to high illumination intensity levels of the scene than the second illumination intensity level (col. 9 line 64-col. 10 line 10). Therefore taking the combined teachings of Gough and Gallagher, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have the saturated pixels are compressed with a higher error corresponding to high illumination intensity levels of the scene than the second illumination intensity level in order to set the compression differently.

[Claim 53]

Gallagher teaches that the first illumination intensity level mapping function represents a greater compression of the resolution of the high illumination intensity levels of the scene than the second illumination intensity level mapping function (col. 9 line 64-col. 10 line 10).

[Claims 93, 107, 108]

These are apparatus claims corresponding to method claims 38, 52, 53 respectively and are therefore analyzed and rejected based upon method claims 38, 52, 53.

11. Claims 48-51 and 103-106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gough (US Patent # 6,816,200), Fossum et al. (US Patent # 6,906,745) and in further view of Kindt et al. (US Patent # 6,348,681).

[Claims 48 and 49]

Gough in view of Fossum fails to teach wherein each discrete illumination intensity level mapping function is a linear illumination intensity level mapping function. However Kindt teaches wherein illumination intensity incident light intensity is a linear function (fig. 4). Therefore taking the combined teachings of Gough, Fossum and Kindt, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have a linear illumination intensity level mapping function in order to extend the dynamic range of the sensor.

[Claim 50]

Kindt teaches wherein the plurality of discrete linear illumination intensity level mapping functions form a composite piece-wise linear illumination intensity level mapping function, the composite piece-wise linear compression being the determined illumination intensity level mapping function, the determined illumination intensity level mapping function being a nearly logarithmic illumination intensity level mapping function (figure 4).

[Claim 51]

Kindt teaches wherein the eight discrete linear illumination intensity level mapping functions form a composite piece-wise linear illumination intensity level mapping function, the composite piece-wise linear compression being the determined illumination intensity level mapping

function, the determined illumination intensity level mapping function being a nearly logarithmic illumination intensity level mapping function (figure 4).

[Claims 103-106]

These are apparatus claims corresponding to method claims 48-51 respectively and are therefore analyzed and rejected based upon method claims 48-51.

Allowable Subject Matter

12. Claims 17, 18, 35, 36, 74,75, 90 and 91 are allowed.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOGESH K. AGGARWAL whose telephone number is (571)272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yogesh K Aggarwal/
Primary Examiner, Art Unit 2622